

**TABLE TOP AND PROCESS OF MAKING THE SAME**  
**CROSS-REFERENCE TO RELATED APPLICATION**

This application is a continuation-in-part of U.S. Patent Application Serial No. 10/411,197, filed by the applicant on April 11, 2003.

**BACKGROUND OF THE INVENTION**

**1. Field of the Invention**

The invention relates to a table top, more particularly to a table top with at least one pre-mounted fastening member and to a process of making the same.

**2. Description of the Related Art**

U.S. Patent Application Serial No. 10/411,197 discloses a table top with a multi-layered structure, which includes a plurality of first decorative members, a mesh layer, a cured binder, a support plate, and a plurality of second decorative members. The first decorative members cooperate with the second decorative members to provide a stereo visual effect. The multi-layered structure reinforces the connection between each layer and the overall structural strength of the table top.

Referring to Figure 1, a conventional table is shown to include a table top 21 and a plurality of table legs 22. An annular member 24 is provided on top of the table legs 22 and is fastened to the table legs 22 with the use of screw members 23. The table top 21 is then adhered

to the annular member 24 so as to complete the conventional table.

It is noted that the aforesaid process for constructing the conventional table is costly and time-consuming. Therefore, it is desired to overcome the shortcomings of the prior art.

#### **SUMMARY OF THE INVENTION**

The main object of the present invention is to provide a table top with at least one pre-mounted fastening member for fastening directly to a table leg and the process of making the same.

Another object of the present invention is to provide a table top with at least one fastening member mounted integrally therewithin and the process of making the same.

According to one aspect of this invention, a process for making a table top comprises the steps of:

- (a) mounting a ring-shaped outer mold on a flat surface;
- (b) mounting a plurality of decorative members which are arranged in a layer on the flat surface and within the outer mold, the decorative members being spaced apart from each other to form gaps thereamong;
- (c) filling the gaps with a curable binder, and providing a layer of the binder on the decorative members;
- (d) mounting at least one fastening member on the

binder, the fastening member including a head portion embedded in the binder, and a fastening portion extending out of the binder from the head portion, and having a cross section smaller than that of the head portion; and

5 (e) adhering a rigid support plate to the binder, the rigid support plate including at least one hole corresponding to the fastening portion of the fastening member for passage of the fastening portion of the fastening member therethrough.

According to another aspect of this invention, a table top includes a top layer, a cured binder, at least one fastening member, and a rigid support plate. The top layer has a plurality of decorative members which are spaced apart from each other to form gaps thereamong. The cured binder fills the gaps and forms a layer that covers a bottom surface of the top layer. The fastening member includes a head portion embedded in the cured binder, and a fastening portion extending out of the cured binder from the head portion, and having a cross section smaller than that of the head portion. The rigid support plate is adhered to the cured binder, and includes at least one hole corresponding to the fastening portion of the fastening member for passage of the fastening portion of the fastening member therethrough.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with  
5 reference to the accompanying drawings, of which:

Figure 1 is a fragmentary schematic view of a conventional table;

Figure 2 is a flow chart illustrating the preferred embodiment of the process for making a table top  
10 according to the present invention;

Figure 3 is a perspective view of an outer mold used in the preferred embodiment;

Figure 4 is a perspective view illustrating an inner mold placed at a center of the outer mold;

15 Figure 5 is a perspective view illustrating first decorative members placed within the outer mold;

Figure 6 is a perspective view illustrating a mesh layer placed on the first decorative members;

20 Figure 7 is a perspective view illustrating a binder layer introduced into the outer mold;

Figure 8 is a perspective view illustrating a plurality of fastening members mounted on the binder layer;

25 Figure 9 is a fragmentary schematic sectional view of Figure 8;

Figure 10 is a perspective view of an example of the fastening member useful in the preferred embodiment;

Figure 11 is a perspective view illustrating a support plate placed over the binder layer;

Figure 12 is a perspective view illustrating weight members provided on the support plate;

5        Figure 13 is a bottom perspective view of a table top produced by the preferred embodiment;

Figure 14 is a top perspective view of the table top of Figure 13;

10        Figure 15 is a fragmentary schematic sectional view of the table top of Figure 13;

Figure 16 is a fragmentary schematic sectional view of the table top of Figure 13 when fastened to a table leg; and

15        Figure 17 is a fragmentary schematic sectional view of another preferred embodiment of the table top of this invention when fastened to a table leg.

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

20        The preferred embodiment of the process for making a table top 3 (see Figures 13, 14, and 15) according to the present invention comprises the steps shown in Figure 2.

25        Referring to Figure 3, in combination with Figure 2, in step 501, a ring-shaped outer mold 71 is mounted on a flat surface 6. The flat surface 6 in this embodiment is a floor. However, the flat surface 6 can also be a glass surface, a working platform, or other suitable flat surfaces. The outer mold 71 is mainly

formed from a resin, and has an inner periphery 711 forming a height from the flat surface 6. However, the outer mold 71 is not limited to the shape and material of the disclosed embodiment. It may be square, rectangle, oblong, or any other suitable geometric shape, and may be made from metal, such as steel or iron, wood, or other materials. In addition, the flat surface 6 is also not limited to a completely flat surface. The surface may be suitably curved so that a table top 3 (see Figures 13, 14, and 15) produced by the process can have a curved outer appearance.

In step 502, the inner periphery 711 of the outer mold 71 and the flat surface 6 within the inner periphery 711 are coated with a wax layer (not shown) or other suitable releasing agent so that when the table top 3 is finally formed, it can be easily separated from the outer mold 71 and the flat surface 6.

In step 503, with further reference to Figure 4, a hollow inner mold 72 made of resin is mounted on the flat surface 6 at the center of the outer mold 71, and is used as a reference for the succeeding processing steps. The outer periphery 721 of the inner mold 72 is similarly coated with a wax layer or other suitable releasing agent. The material and shape of the inner mold 72 are preferably similar to those of the outer mold 71, but the position of the inner mold 72 can be altered according to the shape of the outer mold 71.

When the table top 3 is finally formed, the inner mold 72 will be removed to leave a circular hole in a central part of a top layer of the table top 3 for removable insertion of a post of an umbrella body (not shown) therethrough. As such, the table top 3 can be disposed outdoors with the umbrella body serving as a parasol. However, the inner mold 72 is optional, and can be omitted in other alternative preferred embodiments.

In step 504, with further reference to Figure 5, a plurality of first decorative members 31 are arranged in a layer on the flat surface 6 between the outer and inner molds 71, 72 to form the top layer of the table top 3. The appearance of the table top 3 can be enhanced by varying the materials, colors, and shapes of the first decorative members 31. The first decorative members 31 include tiles 311 which are circumferentially mounted proximate to the inner periphery 711 of the outer mold 71, tiles 312 which are disposed around the outer periphery 721 of the inner mold 72, tiles 313 which are mounted between the tiles 311 and 312, and diamond-shaped tiles 314, each of which is provided among four tiles 313. The tiles 311, 312, 313, 314 are spaced apart from each other to form gaps 315 thereamong, and are cut appropriately prior to their mounting on the flat surface 6. In this embodiment, while the first decorative members 31 are tiles 311, 312, 313, 314, they may be made of marble, glass, mosaic,

metal, plastic, wood, or other natural or synthetic materials, and can have different shapes and colors.

In step 505, with further reference to Figure 6, a mesh layer 32 is mounted on surfaces of the tiles 311, 312, 313, 314. The mesh layer 32 is circular, and has  
5 a dimension slightly smaller than an inner diameter of the outer mold 71, and a central opening 321 for extension of the inner mold 72 therethrough. In this embodiment, the mesh layer 32 has a mesh opening of 5mm  
10 x 6mm, and is a rectangular mesh made of nylon thread. However, the nylon thread can be replaced with other natural or synthetic fiber material. Dimension and shape of the mesh opening can be suitably altered.

In step 506, the mesh layer 32 is adhered fixedly  
15 on the surfaces of the first decorative members 31 by means of an adhesive (not shown) so as to facilitate the succeeding processing steps. In this embodiment, the adhesive includes an unsaturated polyester resin and a suitable amount of curing agent, and requires a  
20 curing time of about ten minutes. Other suitable adhesive or curing agents can be used as well.

In step 507, with further reference to Figure 7, after the above adhesive has cured, a binder 33 is introduced to fill the gaps 315 among the tiles 311, 312, 313 and 314 and to cover a surface of the mesh layer  
25 32. Thereafter, the surface of the binder 33 is leveled to form a binder layer. In this embodiment, the binder



33 has the same material as the aforementioned adhesive, which includes an unsaturated polyester resin and a suitable amount of curing agent. As such, costs can be minimized.

5        In step 508, with further reference to Figures 8, 9, and 10, a plurality of fastening members 34 are mounted on the mesh layer 32 before curing of the binder 33 is completed. In the preferred embodiment, the fastening members 34 are bolts which are spaced apart from each other at an angular distance of about 120°. Each fastening member 34 includes a head portion 341 embedded in the binder 33, and a fastening portion 342 extending out of the binder 33 from the head portion 341. The fastening portion 342 of each of the fastening members 34 has a cross section smaller than that of the head portion 341. The fastening portion 342 of each of the fastening members is formed as a post having an outer thread. The head portion 341 of each of the fastening members 34 is provided with a recess 343 for receiving the binder 33 so as to enhance the positioning effect of the fastening members 34 in the binder 33. Furthermore, the recess 343 in the head portion 341 of each of the fastening members 34 preferably has a non-circular cross section.

25        In step 509, with further reference to Figure 11, a rigid circular support plate 35 is adhered to the binder 33 before the latter is completely cured, and

has a cross-section smaller than that of the layer of the binder 33. At this time, the mesh layer 32 is embedded in the binder 33 between the top layer, i.e., the first decorative members 31, and the support plate 35. The support plate 35 has an outer periphery spaced apart from the inner periphery 711 of the outer mold 71, and forms an annular space 351 with the inner periphery 711 of the outer mold 71. The support plate 35 further has a central hole 352 for extension of the inner mold 72 therethrough, and a plurality of peripheral holes 353 corresponding to the fastening members 34, respectively, for extension of the fastening portions 342 of the fastening members 34 therethrough. Each of the peripheral holes 353 has a diameter which is slightly larger than that of the fastening portion 342 of each of the fastening members 34, and which is smaller than that of the head portion 341 of each of the fastening members 34. Therefore, the head portion 341 of each of the fastening members 34 can be restricted under the support plate 35. In this embodiment, the support plate 35 is a magnesium silicate plate including magnesium oxide (MgO) as its main component. Alternatively, a gypsum plate or other synthetic plate having a definite hardness or other suitable composite plate can be used. Preferably, the plate material is light and tough.

In step 510, with further reference to Figure 12,

a ring-shaped intermediate mold 73 made of resin is mounted concentrically along the outer periphery of the support plate 35. The intermediate mold 73 has a cross-section slightly smaller than that of the support plate 35. The shape and material of the intermediate mold 73 are preferably similar to those of the outer mold 71.

Thereafter, in step 511, three spaced-apart weight members 74 are mounted circumferentially on the support plate 35 so as to press uniformly and fixedly the support plate 35, the mesh layer 32 (see Figure 6), and the binder 34 (see Figure 8) against the first decorative members 31. In this embodiment, the weight members 74 are metal, and weigh 20 kilos each. The weight members 74 are spaced apart from each other at an angular distance of about  $120^{\circ}$ , but are not limited as such.

Subsequently, in step 512, a plurality of spaced-apart second decorative members 36 are bonded to the layer of the binder 33 around an outer periphery of the support plate 35 but within the annular space 731 between the outer and intermediate molds 71 and 73. The second decorative members 36 form a decorative edge for the table top 3 (see Figures 13 and 14). The second decorative members 36 are spaced apart from each other to form gaps 361 thereamong. In this embodiment, each of the second decorative members 36 is a tile, which has a cross-section of an inverted-L shape, and has a

horizontal portion 362 (see Figure 15) extending radially and inwardly and situated below the support plate 35, and a vertical portion 363 (see Figure 15) extending integrally and upwardly from the horizontal portion 362. It should be noted herein that the shapes and materials of the second decorative members 36 can be chosen to be similar to those of the first decorative members 31.

Thereafter, in step 513, the binder 33 is filled in the gaps 361 so that each second decorative member 36 exerts a pressing force on the outer periphery of the support plate 35 through the binder 33.

Finally, in steps 514, 515, after the binder 33 in the gaps 361 in the second decorative pieces 36 has cured, the intermediate mold 73 and the weight members 74 are removed, and the table top 3 is pulled out of the outer mold 71 and the inner mold 72, and is subsequently polished and finished in a conventional manner, thereby completing the table top 3 shown in Figures 13 and 14.

Figures 13 and 14 are perspective views as viewed from the bottom and top of the table top 3, respectively. Figure 15 is a sectional view of the table top 3 of Figure 13. The table top 3 includes the first decorative members 31, i.e., the tiles 311, 312, 313, 314, arranged in a pattern such that the top layer has a circumferential outer periphery. The binder 33 is cured, and extends between adjacent ones of the first

decorative members 31. The mesh layer 32 (not visible in Figures 13 and 14) is embedded in the cured binder 33. The fastening members 34 are mounted by embedding the head portions 341 of the fastening members 34 in the cured binder 33. The table top 3 further includes the L-shaped second decorative members 36 that are formed as tiles, each of which is attached to a bottom surface of the layer of the cured binder 33. The second decorative members 36 are disposed along the outer periphery of and below the top layer. The cured binder 33 extends between adjacent ones of the second decorative members 36. The second decorative members 36 protrude downwardly from the bottom of the support plate 35, thus providing a stereo visual effect.

Referring to Figure 16, when assembling the table top 3 on table legs 4, the fastening portions 342 of the fastening members 34 are extended through holes 41 in the table legs 4 respectively, and nuts 42 are used to engage the fastening portions 342 so as to retain the table legs 4 on the fastening members 34. Furthermore, the non-circular cross section of the recess 343 in the head portion 341 of each of the fastening members 34 can avoid undesired rotation of the fastening members 34 during tightening of the nuts 42.

It is understood that the configuration of the fastening member 34 can be modified by one skilled in

the art without departing from the spirit and scope of this invention. For example, referring to Figure 17, in an another preferred embodiment, the fastening member 34' is formed as a socket having an internally threaded hole 344' extending through the head portion 341' and the fastening portion 342'. A barrier film 35' is provided on the head portion 341' of the fastening member 34' so as to prevent the binder 33' from entering into the threaded hole 344'.

While the present invention has been described in connection with what is considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.